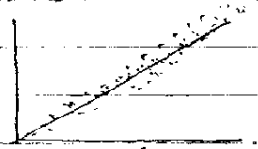
Chapter 10

Linear regression



$y = a + bx$

y = dependent variable

x = independent (predictor) variable

value of y when x = ∅

$y = y\text{-intercept} + \text{Slope}(x)$

Change in y for a 1-unit increase in x

$y = \beta_0 + \beta_1 x$

(β_0: y intercept; β_1: Slope of x)

95% CI

= mean or Avg of means ± 1.96 (SD or sum of SD's)

95% CI
% of Means = ((UCI − LCI)/2) / mean or Avg of Means

Report

- Prediction intervals
- " errors
- %CV
- Regression
  - *Simple
  - *Multiple
  - *weighted
- variance
- SD
- 95% CI
- coefficient p-values
- accuracy vs. precision
  - RMSE
  - PRESS

*Dependent variable (Y)
*Independent variables (X)
*Residual plots

Coefficients of determination
- R^2
- adjusted R^2
- p-value
- F-statistics

Relative prediction error for a constituent yield for a brand is:

$$\frac{\text{measured yield} - \text{predicted yield}}{\text{measured yield}}$$

Avg absolute relative prediction error (Average ARPE) is the calculated for a constituent as follows:

Sum of ARPE's for each validation brand, averaged over the nine validation brands

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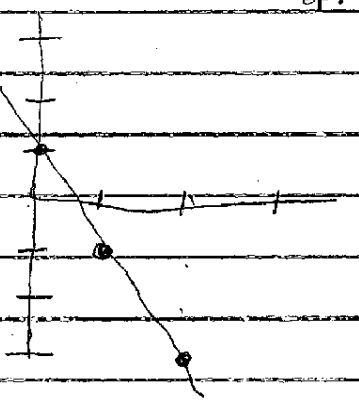
Source: https://www.industrydocuments.ucsf.edu/docs/tglx0001

$y = -2x + 1$

x	y
0	1
1	-1
2	-3

$-(-1)+1$

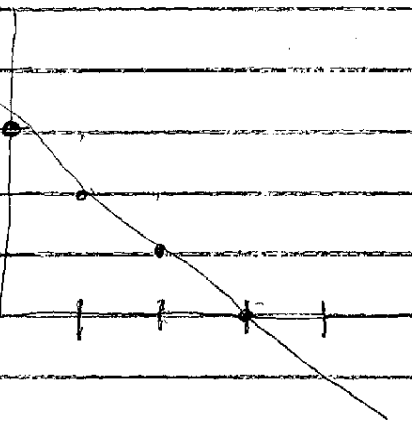


y-int = 3

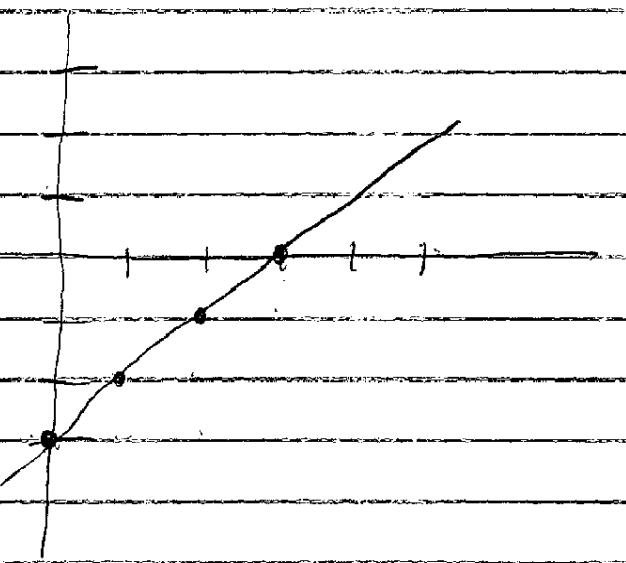
Slope = -1

$y = B_0 + B_1 x$

$y = 3 - x$



$y = -3 + x$



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Source: https://www.industrydocuments.ucsf.edu/docs/tglx0001